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(71) Applicant: **UNITED PARCEL SERVICE OF AMERICA, INC.**
400 Perimeter Center,
Terraces North
Atlanta, GA 30346(US)

(72) Inventor: **Hess, William D.**
7K Mullholland Drive
Fishkill, NY 12524(US)
Inventor: **Skinger, Gregory P.**
45 Winterwood Drive
Southbury, CT 06488(US)

(74) Representative: **Patentanwälte Beetz - Timpe - Siegfried Schmitt-Fumian - Mayr**
Steinsdorfstrasse 10
D-80538 München (DE)

(54) Multiple code camera system.

(57) The camera system (10,100) of the present invention simultaneously searches for a number of differing optical acquisition targets (44). Upon detecting an acquisition target (44) it decodes according to corresponding differing decoding algorithms. To facilitate this operation there is a system bus (170) as well as a dedicated data bus (172) for applying a scan signal of an optical scanning device (154) to differing detection circuitry. This system may decode, for example, both bar codes and concentric rings. The scan signal is constantly adjusted according to both a dark reference for correcting offset and a white reference for correcting gain. The gain is also corrected according to the scanning rate as well as the amount of illumination present. A measure of this illumination may be applied directly to the optical scanning device (154) by way of a fiber optic cable (402) which transmits light from the illumination source (15). When detecting concentric rings the system of the present invention uses stored templates which represent a number of transformations of the target (44), for example, a number of magnifications. When the transformation of a target (44) is determined, the corresponding stored template is correlated with the scan signal from the optical scanning device (154). To detect concentric rings the scan signal is applied to interleaving circuitry (180) which correlates more than one scan at a time to provide constant throughput even though the stages of the detector operate at different speeds. Optical calibration is eliminated by fixed optics wherein all optical elements are rigidly mounted at very close tolerances. The illumination source (15) is disposed on one focus (22) of an ellipse (18) wherein the other focus (24) is disposed at the maximum scanning distance and the reflector (14) is formed to define the illumination ellipse (18) to maximize the light applied to the object (42). The various heat producing elements are disposed in sealed compartments (40a,b,c) which are cooled by forced air which is circulated through a heat exchanger. A real time focusing system is provided wherein the distance from the scanning device to an opposing surface is constantly monitored and the system is constantly focused according to the distance.

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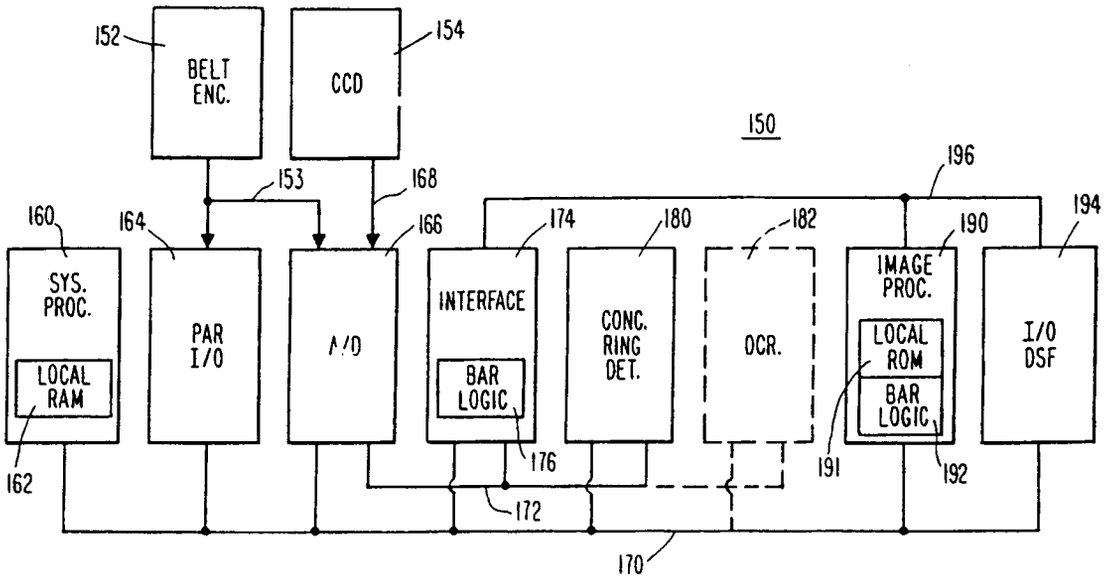
152
BELT ENC.
154
CCD
150
153
168
196
160
164
166
174
180
182
190
194
SYS. PROC.
LOCAL RAM
PAR I/O
A/D
INTERFACE
BAR LOGIC
CONC. RING DET.
OCR.
IMAGE PROC.
LOCAL ROM
BAR LOGIC
I/O DSF
162
176
172
191
192
170

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 93 10 8176

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	US-A-4 408 344 (MC WATERS,L.D. ET AL) * column 1, line 29 - line 34 * * claim 1 * * figure 1 *	1-5,9	G06K7/10
A		8,12,17, 19,23, 24,29, 35,37, 38,41, 48,52	
D,A	US-A-4 896 029 (CHANDLER,D.G. ET AL) * column 7, line 65 - line 68 * * column 27, line 44 - line 68 * * column 28, line 1 - line 5 * FIGURE 6 : REF. 206	17,33, 46,58	
A	EP-A-0 159 608 (GEBHARDT FÖRDERTECHNIK GMBH) * page 1, line 1 - line 8 *	17,33, 34,46, 47,58,59	TECHNICAL FIELDS SEARCHED (Int.Cl.5) G06K
A	EP-A-0 115 558 (GEBHARDT FÖRDERTECHNIK GMBH) * claim 1 *	18,34, 47,59	
A	PATENT ABSTRACTS OF JAPAN vol. 015, no. 492 (P-1287)12 December 1991 & JP-A-03 212 783 (RICOH CO LTD) 18 September 1991 * abstract *	14-16, 31-33, 44,46, 56,57	
A	FR-A-1 578 217 (SVEJSECENTRALEN) * figures 3,7 *	9,10,12, 13,26, 27,42,43	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	1 February 1994	Herskovic, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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